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MULTIPLE USE WATER SYSTEMS (MUS) MANUAL

DEVELOPED FORUSAID/NEPAL'S EDUCATION FOR INCOME GENERATION PROGRAM (EIG)

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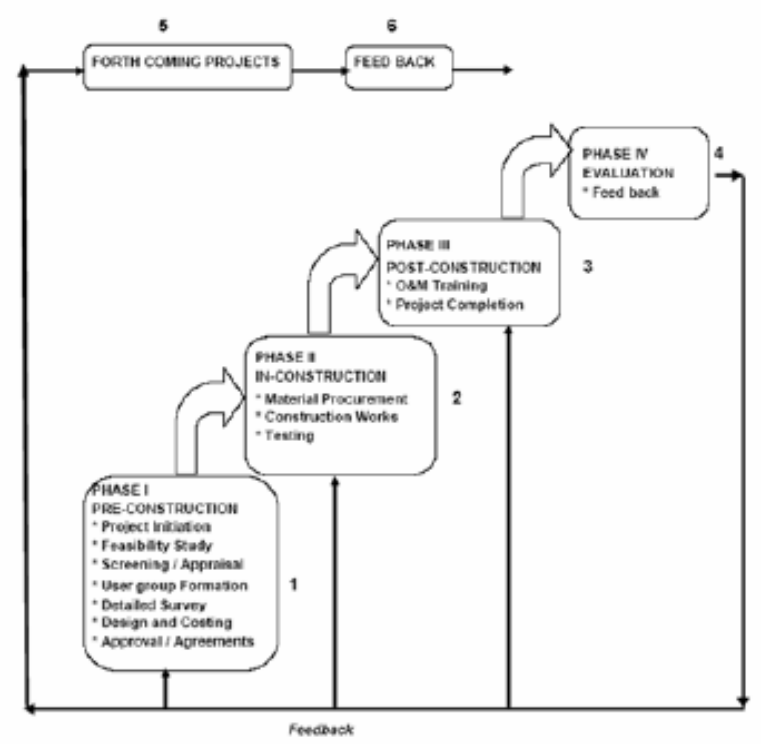
Multiple Use Water Systems (MUS)

Project Implementation Guidelines

For

Technical Staff at the Field Level



ACRONYMS

BDS	Business Development Services
CBO	Community Based Organization
CO	Coordinating Organization
CPWF	Challenge Program for Water and Food
DLO	District Level Organization
DMUS	De-facto Multiple Use Water System / Services
FCL	Ferro Cement Lining
I/NGO	International Non-Governmental Organization
IWMI	International Water Management Institute
MTJ	Modified Thai Jar
MUS	Multiple Use Water System / Services
MUSD	Multiple Use Water System / Services by Design
O&M	Operation and Maintenance
PS	Project Supporters
RL	Reduced Level
SIMI	Smallholder Irrigation Market Initiative
SUS	Single Use Water Systems
VDC	Village Development Committee
VLO	Village Level Organization
WUA	Water Users Association

Contents:

TERMINOLOGY

Domestic Use of Water: Consumption of water for domestic needs such as drinking, cooking, cleaning, sanitation.
Productive Use of Water: Consumption of water for operation of enterprises based on water. For example: irrigation of crops, raising livestock, and aquaculture.
Single use systems: A water system designed and used only to serve productive or domestic use.
De- facto multi-use system: A system designed for a single use (productive or domestic) but put into practice for multiple uses.
Examples:
- Using water from a drinking water tap for kitchen gardening.
- Tapping water from an irrigation canal for bathing and washing.
Multiple use systems (MUS): A system designed to meet both the domestic and productive water demands. For example: A piped water system providing water supply for domestic needs and irrigation of vegetables.
MUS: The Multiple Use Systems project funded by the Challenge Program on Food and Water with the International Water Management Institute as the lead and implemented by International Development Enterprises (IDE-Nepal) in Nepal.
In the context of this guideline MUS schemes refer to either upgrades of existing schemes or new schemes which are gravity fed pipe piped water systems.

Project: All activities included during the planning, designing and construction stages of MUS.

Water Scheme: Configuration of the proposed MUS.

Coordinating Organization (CO): The organization playing the main coordination role in project design and implementation. As part of the operating team, the CO hires social mobilizers and community mobilizers selected from the community to form a direct link with the community and ensure active participation in the project.

District Level Organizations (DLO): Government and non-government organizations at the district level with a mandate to support small water projects.

Village level organizations (**VLO):** Local organizations involved in rural development activities including domestic water supply and small scale irrigation. These include: Village Development Committee (VDC), Community Based Organizations (CBOs), local clubs, mother groups, etc.

Stakeholders: Organizations or individuals who have an investment, share, or interest in the project.

Water Users Association (WUA): The committee ormed out of the potential water users of the proposed scheme for management of the project construction, operation and maintenance.

Simple Tap-stand: A simple form of tap-stand for distribution of domestic water. In a continuous flow MUS, this tap also provides water for productive use. In each OD, two taps are provided.

Offtakes: A water outlet point for productive use (such as micro-irrigation) in the form of a dwarf concrete post with dual taps.

Simple Tap-stand (Domestic)

Offtakes (Productive)

Main Tank Types

Modified Thai Jar: A tank model with capacities of 1,000, 1,500 or 3,000 litres. This type of tank is generally used as the domestic water tank in MUS systems, however in a continuous flow system this tank is used for both domestic and productive purposes. It also can be used at the household level.

Ferro-cement Lined: A tank model with capacities of 6,000 or 10,000 litres. This is generally used as the overflow tank for productive use purposes in MUS systems.

Modified Thai Jar Tank

Ferro-cement Lined Tank

2. Introduction

For rural and peri-urban households water is required for various needs which can be can be broadly categorized as ***domestic*** —drinking, cooking, cleaning, and sanitation—and ***productive*** —irrigation for gardens and field crops, livestock raising, brick making, food processing and other enterprises. These productive activities make a major contribution to rural communities in income generation and food security.

It has been long recognized that locally available water is used simultaneously for both domestic and productive purposes. *MUS by design* are water systems designed whereby a single water system fulfills both *domestic* and *productive* water needs. As such, it takes into account the water demands for each of those components. Because MUS includes productive use the community is more likely to invest in the installation and maintenance required for the sustainability of their water system.

With the support of the Challenge Program on Water and Food, five organizations are currently implementing a global MUS research project, led by the International Water Management Institute (IWMI). IDE is one of the implementing partners of this project. The goal of the MUS Project is to explore ways to improve poor people's livelihoods, reduce unpaid workloads, alleviate poverty and enhance gender equity through more productive use of small-scale water supplies. The MUS project has established 16 principles to guide its activities. And, in order to promote the scaling up of the mus concept, the MUS project has adopted a Learning Alliance approach.

There can be a number of mus designs depending on the type of water source, its location in relation to the community, water quality and desired/available technologies. Examples include:

1. Spring water distributed by a gravity system
2. Treatment and supply of stream/river water
3. Lifting and distribution of groundwater/lake water
4. Rain water collection and distribution

This guideline illustrates the recommended process for mus implementation based on a 4-year experience of constructing over 60 mus systems in Nepal. The main objective of this document is to help guide field-level managers and technicians in the process of project development and implementation.

In Nepal, mus by design was first conceptualized and field tested by IDE/Nepal in 2001 in Palpa district. Based on the encouraging results of the systems, it was expanded to several of IDE's other projects including Nepal-SIMI, UJYALO, and BDS/MaPS. In recent years, government staff at all levels, international and national NGOs, local organizations, and communities themselves have all shown keen interest in mus. During the past 5 years over 60 mus systems have been built in nine hill districts of both the western and far-western regions of Nepal. Field evaluation of the schemes indicates highly positive results for enhancement of rural community livelihoods.

The main features of MUS are:

1. Access to water supply for multiple needs from a single system
2. Low construction and maintenance costs
3. Relatively short construction period (less than 3 months on average)

4. Low pay back period (less than 2 years)[1]
    a. Reasonably low per-capita investment cost (less than Rs.1500)
    b. Relatively low Investment (average cost per system < Rs. 150,000)
5. Improved operation and maintenance of the system due to financial incentives
6. Economic improvement for rural families through water-based enterprises
7. Reduced drudgery for water collection
8. Improved sanitation and hygiene practices
9. Productive utilization of a small water sources
10. Innovative / low cost structures (jar and soil cement tanks, simple tap-stand and off-takes) .
11. High level of community participation in scheme construction (greater than 30 %)
12. Relatively short construction period

3. Types of mus designs

Depending on the amount of water available in the source (scarce, moderate, abundant), three types of mus can be constructed:

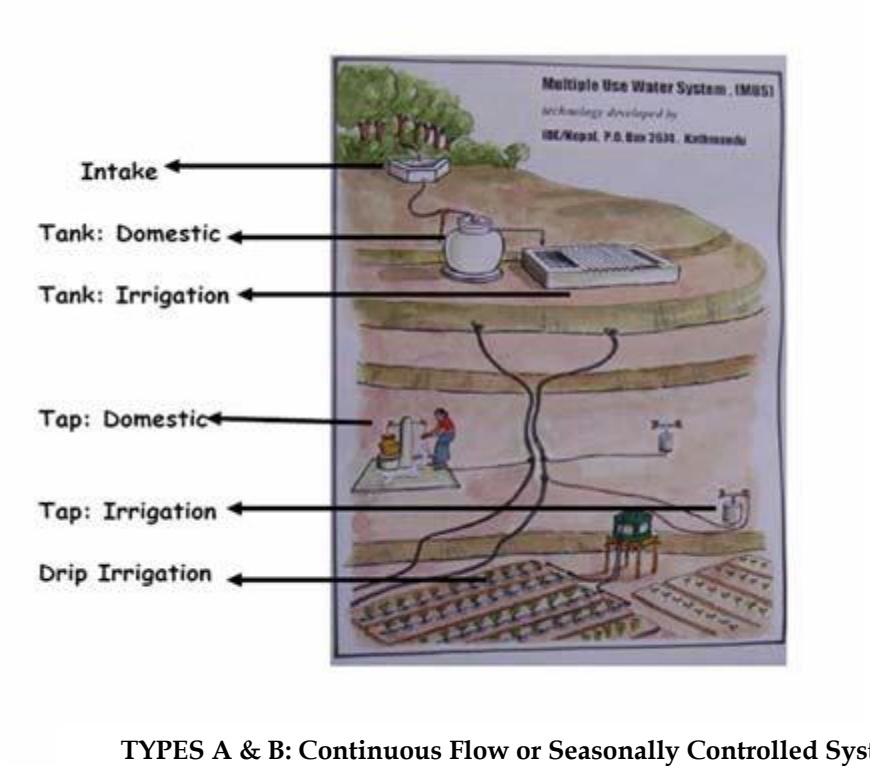
TYPE A: Continuous Flow System
TYPE B: Seasonally Controlled System
TYPE C: Year-round Controlled System

TYPE A: Continuous Flow System
This type of MUS is built if the safe discharge at the water source is more than 1.5 times the projected water demand. Water is supplied throughout the day from the tap-stands without regulating the flow in the main tank. However, this type of system is not recommended if the household number exceeds 40 and/or the pipe network is more than 4 kilometers long.

TYPE B: Seasonally Controlled System
If the flow of the water source is not adequate to meet the design demand throughout the year, this seasonal design must be adopted to ensure domestic water supply in the dry season. There are two separate water tanks – one for domestic and one for productive uses. Water from the source is first supplied to the domestic water tank. Once it is filled, the surplus water will be directed to the productive water tank beside it. Such a design allows first priority for domestic water use. There will be two separate distribution pipelines – one leading to tap stands and the other to irrigation off-takes. As far as practicable, both the domestic and productive pipelines will be laid along a common trench. Tap stands are located in between houses to serve domestic demand. On the other hand off-takes are constructed approximately at the center of the irrigation field of few landowners (on average 3-6 households).

Water distribution is controlled from the outlets of the two main tanks, depending on the water availability during different seasons of the year. Although, this type ofdesign is relatively more costly due to the two tanks and distribution systems, the design removes the potential conflict between domestic and productive uses by prioritizing domestic use. This is the most common type of system built in Nepal to date.

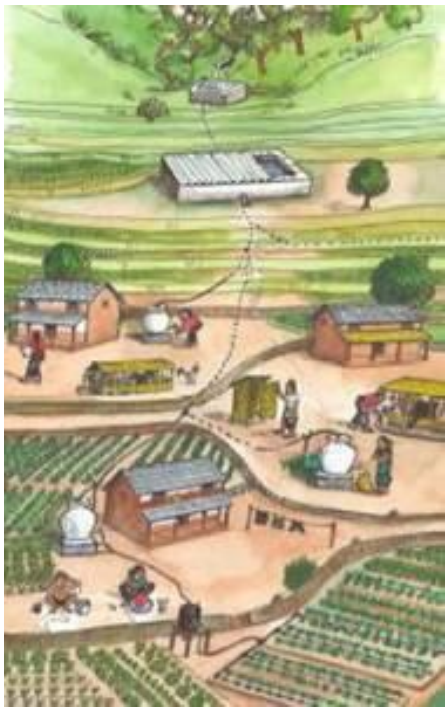
[1] This is based on farmer interviews and internal evaluations.



TYPES A & B: Continuous Flow or Seasonally Controlled System
(the change is based on how the system is managed)

TYPE C: Year- round Controlled System

If the water source is just enough to meet the design demand, Type C is recommended. This system is similar to the continuous flow system in terms of the single main tank and pipe network, however in addition, each household has a storage tank at the house. Based on a community-developed schedule, house tanks are filled on a turn-by-turn basis and the household members choose how much water to use for each purpose.



TYPE C: Year-round Controlled System

4. Implementation Framework and Process

4.1 Overview

The entire mus process is carried out in the following four phases**.**

Phase I: Pre-construction

The ***pre-construction phase*** includes all the activities from initiation to approval of the scheme. The main activities conducted during this period are the feasibility study, survey, design, system costing, and formation of the Water User Association (WUA). By the end of this phase a formal agreement is made among the stakeholders. The most critical activities include community participation in scheme plan development, formation of a functional WUA, readiness for the adoption of micro irrigation technologies and establishment of a water tariff . The CO in collaboration with the VLO are responsible for creating a solid relationship with the community and ensuring their participation throughout all activities. After formation of the WUA, it will take the lead role in mobilizing the community.

Phase II: Construction

The ***construction phase*** begins with the collection and procurement of the construction materials. Lines and levels are provided for the pipelines and structures. The transmission pipeline is first completed followed by tank construction and the distribution pipelines. Finally, the tap stands and offtakes are built. After completion of all construction, testing is carried out. If the test results are found to be satisfactory, backfilling is done for the pipeline and structures.

Phase III: Post-construction

After successful construction and testing of the scheme, a WUA meeting is called. The progress is reviewed and Scheme Operator and Caretakers are nominated. Then the operator is provided a practical training on system operation and management. Likewise, caretakers are given orientation on the proper upkeep of the system components. A project completion report is prepared at the end of the ***post construction phase***. A ceremony is held where the detailed report of the scheme implementation process is presented.

Phase IV: Performance Evaluation

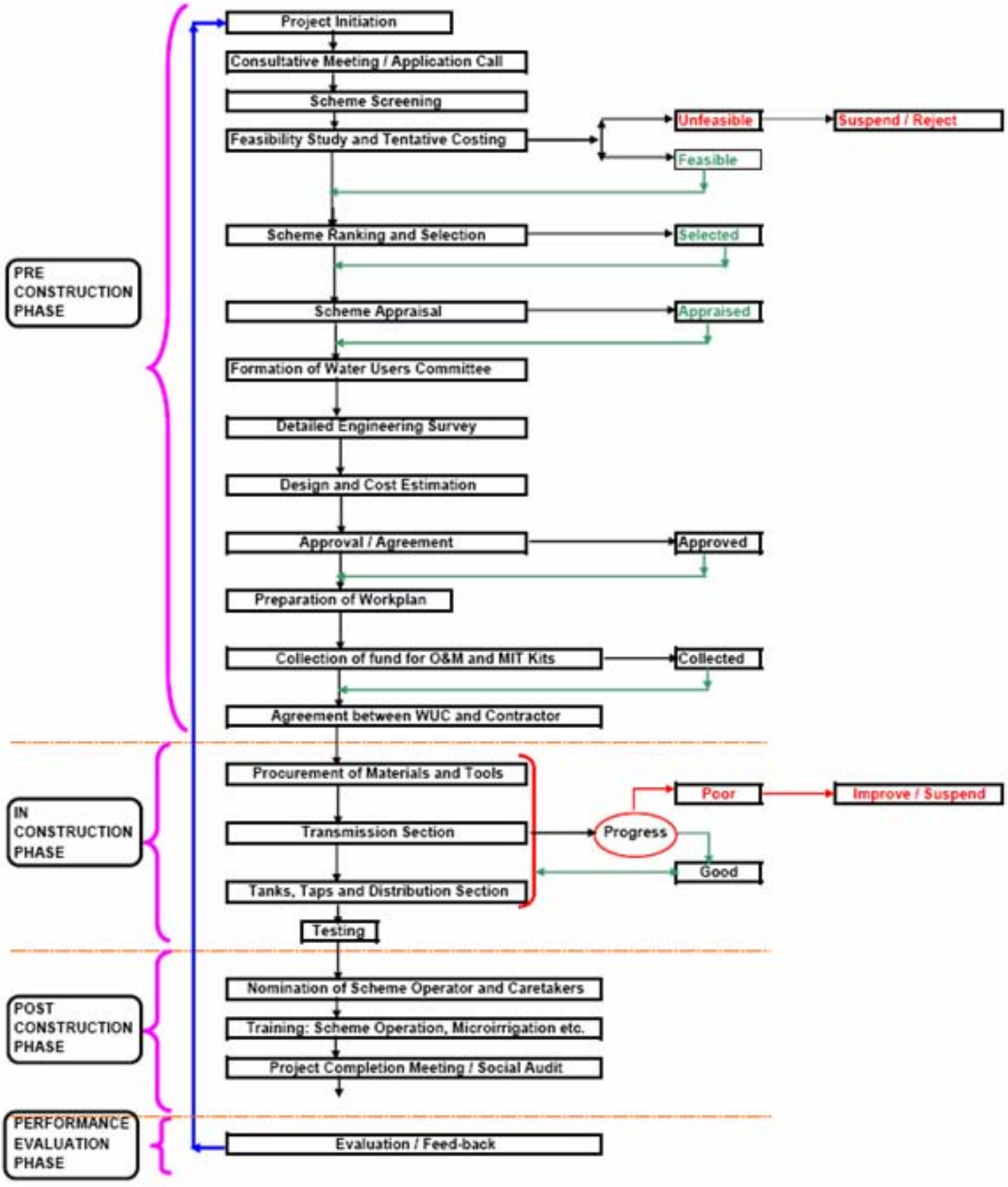
Periodic evaluations on the performance of the system are done within a few years of scheme completion. This period is called the ***performance evaluation phase***. Evaluation is carried out both internally and externally. The WUA performs the internal evaluation while external agencies supporting the project conduct the external evaluation. It is recommended that some financial resources be deposited in the account of WUA during the construction phase.

Stakeholder roles

The Coordinating Organization (CO) initiates the process of scheme identification and is primarily responsible for technical support and community mobilization activities. District level line agencies and partner NGOs play both a financial and technical support role. During the scheme construction and evaluation phases, these organizations monitor the project and provide suggestions for improvement. VLO representatives play a major role during the pre-construction phase by contributing financially or in-kind, and building rapport in the community. The WUA is the main coordinating body that works with beneficiary households to carry out the engineering survey, collection of O&M fund, provision of voluntary labor for construction, and management of the scheme after construction. The WUA also works with the CO to obtain construction materials and organize trainings.

Multiple Use Water Systems (MUS)

Procedural Steps of the Project Design and Implementation



Roles of various organizations in the MUS Project

Step	Activity	VLO	DLO	CO	WUA
A	**Phase I: Pre-construction phase**				
A.1	Project Initiation	S	M	M	N
A.2	Consultative meeting / Application Call	S	M	M	N
A.3	Scheme Screening	M	S	M	N
A.4	Feasibility Study & Tentative costing	M	S	M	N
A.5	Scheme Appraisal	S	M	M	N
A.6	Formation of WUA	M	N	S	M
A.7	Detailed Engineering Survey	M	S	M	M
A.8	Design and Cost Estimation	N	N	M	S
A.9	Scheme Approval / Agreement	N	M	M	M
A.10	Preparation of Work-plan	S	S	M	M
A.11	Collection of Fund for O&M and micro irrigation kits	S	N	S	M
A.12	Agreement bet WUC and the Contractor	S	N	S	M
B	**Phase II: Construction phase**				
B.1	Procurement of Materials and Tools	S	M	M	M
B.2	Construction : Transmission Section	S	N	M	M
B.3	Construction : Tank, Taps & Distribution Section	S	N	M	M
B.4	System Testing	S	S	M	M
C	**Phase III: Post-construction phase**				
C.1	Nomination of Scheme Operator & Caretakers	S	N	S	M
C.2	Training: Scheme Operation, Microirrigation	S	S	M	M
C.3	Project Completion Meeting / Social Audit	S	S	M	M
D	**Phase IV: Evaluation Phase**				
D.1	Performation Evaluation	S	M	S	S

Legend	
S	Supportive Role
M	Main Role
N	No Role

4.2 Pre-Construction Phase

4.2.1 Project Initiation, Scheme Identification:
In order to identify the potential mus sites within a pre-determined working area, the CO contacts DLOs including the District Development Committee, Water Supply Office, Irrigation Divisions, Agriculture Development Office and I/NGOs working in the district. Based on the informal visits and available information, a list of potential schemes is prepared.

4.2.2 Joint Consultative Meeting / Application Call
A meeting is organized with the DLO and VLO representatives with the main objective of sharing MUS and discussing the potential schemes according to the prepared list. Basic criteria for MUS is explained *(Annex 1)* in the meeting. The social mobilizers/community mobilizers and local VLOs perform a participatory rural appraisal in the community in order to assess the status of various potential communities, after which a short list of the potential schemes is prepared. VLO representatives are asked to submit an application to the CO within two weeks of the meeting. Along with the application form the following documents are requested:

1. A cover letter
2. Basic Information about the scheme *(Annex 2)*
3. A letter stating that there is no objection for community use of water source from the source owner
4. Recommendation letter from the village authority (the VDC and Ward Office together) for scheme construction. The letter is issued by the VDC upon the recommendation of the Ward Office.

4.2.3 Scheme Screening
The MUS applications are organized and scored as per the Scheme Screening Table *(Annex 3).* A second meeting is then held with the DLOs. The scoring chart is presented and discussed. The DLO then decides the list of potential schemes that is justified for continuation along the process.

4.2.4 Feasibility Study and Tentative Costing
A CO technical staff team visits the remaining potential sites for carrying out the feasibility studies. The VLO representatives provide necessary support to the team for organizing the community meeting and making field observations. *Annex 4* shows the format of the feasibility study.

The necessary equipment for the feasibility study includes an altimeter, pedometer/rope, bucket, Stop-watch, and calculator. It is recommended to take photographs of the community meeting, settlement, proposed tank site and water source for later reference.

Feasibility study activities:
1. Community meeting
2. Interview with the local leaders
3. Discharge assessment of the water source
4. Pacing of tentative alignment of the pipeline
5. Area measurement of the proposed sites for the main tank(s)
6. Recording the elevations of strategic points- source, reservoir site, outlets etc
7. Acquiring district basic rate of material and labor(these must be attached to the feasibility form)

Based on the information collected from the field, an approximate cost estimation is prepared using both quantitative and qualitative parameters.

4.2.5 Scheme Ranking and Selection

Once the feasibility study is performed, a second round of project selection is undertaken using the Scheme Ranking Chart *(Annex 5).* If deemed important, a second field visit may be necessary to one or more sites. A summary sheet of the ranking table is prepared by the survey team and presented in the third DLO meeting for scheme selection. Once the final schemes are selected, the VLO representatives of the selected schemes are asked to contact the CO team who will determine the date for the upcoming field survey.

4.2.6 Scheme Appraisal

The appraisal is the process where potential funders visit the community and determine whether they wish to financially support the project. Approval for the project can take place only after the commitment for financing has been finalized. The appraisal team is composed of both DLO and CO staff who review the various economic and technical requirements for selected schemes through the field verification. A brief appraisal report is prepared by the team. The schemes with positive appraisal assessment are selected for carrying out detailed engineering survey and design.

4.2.7 Formation of the Water User's Association

Following the satisfactory appraisal of the scheme the VLO is asked to help the community form a Water Users Association, (WUA). A nine member committee is formed with proper representation from all sectors of the society (women, ethnic groups, disadvantaged groups, etc.). At least 33% of the overall committee and at least two executive positions should be held by women. The WUA is responsible for smooth project implementation and is accountable to all users.

The WUA is responsible for:

1. Assisting the technical team during the engineering survey
2. Collection of the O&M fund and purchase of micro-irrigation units
3. Mobilizing user households to provide labor for scheme construction
4. Keeping records of the materials, income/expenditures and labor contribution (See *Annexes 6-8*)
5. Supervision of the work
6. Nominating the water operator and the caretakers
7. Resolving social or technical issues related to the project

The meeting of the WUA is held at least twice per month during the construction period, depending on project needs. After project completion the meeting interval drops to once per month. The WUA prepares and updates bi-laws for the smooth management and operation of the water scheme.

4.2.8 Detailed Engineering Survey

The detailed engineering survey mainly consists of determining elevations and alignments (also called "Reduced Levels" or RLs) of points along the proposed pipeline alignment and the proposed sites for the tank, tapstands, off takes and other system structures. The survey work begins from the source and works down towards the outlets (tap-stands and offtakes). Water discharge is measured and reassessed to determine if the volume available matches need. The location of the structures and main points along the alignment are marked on the spot with wooden pegs and clearly mentioned in the field book.

The detailed survey report consists of a project layout map showing the positions of prominent places such as the school, VDC office, religious places like temples, house locations and their elevations . The location of MUS infrastructure such as the intake, sedimentation tanks, reservoir tank(s), tapstand posts, and offtakes, which were tentatively chosen during the feasibility survey are ratified during the survey.

For small water systems an Abney Level Survey is commonly employed. However, there may be the need for conducting an auto level or theodolite survey for relatively complex and large systems.

Abney Level Survey:

The instruments required for this type of survey include an Abney level, compass, range rods, measuring tape, and an altimeter

The Abney level is the most widely used instrument to determine elevations in rural gravity flow water supply systems because it can be used in places with rolling or steep slopes and can give the accuracy of vertical angles up to 20 minutes. The survey conducted by the Abney level should be supplemented by leveling machines or the theodolite if the area is relatively flat. The data form for the Abney level is given in *Annex 9*.

Surveying Procedure (graphically illustrated in *Annex 10)*:

1. In the ranging rod of the objective a prominent level mark is made equal to the eye level of the surveyor. This Altimeter reading is set as the benchmark elevation
2. The vertical angle is measured by sighting the level mark
3. Using the compass, the horizontal angle is measured
4. The slope length is measured with the measuring tape
5. To determine the rise or fall from the surveyors station, the following formula is used:
6. h = +- (l X sin A)
7. Elevations are computed by adding or subtracting the elevation of the previous station
8. Elevations are verified by the altimeter for every 20-metre difference of level.

Automatic level (Auto-level) Survey

This is the most accurate instrument to determine level differences. This is used in places of flat topography and areas where the highest accuracy is desired. Since mus in Nepal has generally been implemented in the hills where the land is sloped, its use for mus has been limited. However, it is used in critical sections where the slopes have to be measured very accurately. Compared to the Abney level survey, the auto-level survey is time consuming and labour intensive.

Theodolite Survey

Just like auto-level survey, the use of the Theodolite survey is also not generally necessary in the hill areas. However, when needed, it is sometimes used to verify levels determined by the Abney level.

4.2.8.1 Design and Cost Estimation

Based on the data from the feasibility study and detailed survey, the scheme is designed and its cost estimate is prepared. This is done by qualified engineers from the district or central level CO. The detailed scheme design document (also called a Yellow Report) should contain the following:

1. Salient Features
2. Calculation of water demand (demographic data, command area, institutional need)
3. Plan and profile of the proposed alignment
4. Sizing of the main tank(s)
5. Hydraulic design chart
6. Cost estimate of the different components
7. List of materials and required labor
8. Working drawing of the structures
9. Photographs (optional)

4.2.8.2 Scheme Approval / Agreement

After completion of the Yellow Report the CO facilitates the WUA members to visit the DLO and VLO to request financial support for the schemes. It is also sometimes necessary to coordinate with central level organizations for their financial support. The project is approved only after receiving commitment from various sources to cover the entire construction funding requirements. At this stage, an agreement among all stakeholders is signed *(Anne 14)*. The agreement identifies the role and responsibilities of each contributing organization.

4.2.9 Preparation of Work-plan

Following the approval and agreement for scheme construction, a WUA meeting is organized with request for participation from representatives of all supporting organizations. A detailed work plan for construction is prepared *(see Annex 12)* and signed by the representatives of the WUA, CO and other supporting organizations. Minutes are taken at the meeting.

4.2.10 Collection of Fund for O&M and Micro-irrigation

Before the commencement of construction, the operation and maintenance (O&M) fund is collected from beneficiaries. Depending on the size of the scheme, the upfront O&M cash deposit ranges from Rs. 500 – 1000 per standpost/offtake. As mentioned earlier, 75% of the total beneficiary households should have committed to purchasing micro irrigation technology (MIT) – a drip or sprinkler kit. It is suggested that every MIT user deposit a third to a half of the MIT system cost during the O&M cost collection stage. The WUA keeps the records of these deposits for transparency of contribution.

4.2.11 Agreement between WUC and the Contractor / Mason

In order to carry out construction the WUA, with support from the CO, selects a contractor or lead mason and negotiates a contract. The contract states the clear responsibilities of each party, payment and work schedules. *(See Annex 15).* The representative of the CO provides assistance in work schedule preparation and acts as witness to the agreement.

4.3 Construction Phase

4.3.1 Procurement of Construction Materials / Tools

The construction materials and tools can be separated into two categories - manufactured and local. The main items under each category are given in the following table.

Table 4.3.1: Materials and tools for construction

Manufactured Materials	**Local Materials**
Cement	Sand
Steel rods	Stone
Pipes	Gravel
Pipe and fittings	Dirt
CGI Sheet	Bamboo
Chicken wire mesh	
Manufactured Tools	**Local Tools**
Wrenches	Ladder
Dies	Buckets
Shovels	Ropes
Baskets	
Pigs	

Formworks / Jute bags	

In general, the CO, DLO, and VLO provide financial support for the purchase of manufactured materials and tools while the beneficiaries are responsible for arranging local materials and tools and transporting the manufactured materials from the road to the construction site. These arrangements are clearly mentioned in the stakeholder work plan agreement.

4.3.2 Construction of Pipelines:

Excavation of the pipe trench is conducted by the community. Mobilization and encouragement is generally required of the WUA to make sure that beneficiary households follow through with the promised labor. The WUA keeps a record of labor performed by each household.

The transmission pipelines are laid first followed by the distribution pipeline. Pipelines are buried at least 90 cm below the ground except where there is hard rock. The width can vary from between 40–60 cm. As far as possible, High Density Polyethlyne Pipe (HDPE) of Nepal Standard (NS) mark is used for both the transmission and distribution lines. However, GI pipes must be used in the exposed sections and inlets/outlets of the structures. The technical staff of the CO is responsible for conducting pipe alignment.

4.3.3 Progress Review Meeting / Supervision Visits

During the entire construction period the WUA conducts progress review meetings on a weekly basis with the participation of a CO representative. DLO and VLO members are also invited to attend the review meetings when the WUA deems it necessary. The CO coordinates with the DLO and WUA to arrange the supervision visits of the DLO representatives. At least one field supervision visit during the construction period is suggested.

4.3.4 Construction of Structures

The major structures of the mus are the intake, storage tanks, and water outlets. Depending on the alignment, some minor structures such as a break pressure tank, washout, air valve, or gully crossing might also be required. Every structure is constructed according to strict quality control mechanisms supervised by the team of CO technicians and the WUA representatives.

Intake

The structure made to capture water from the source is called the intake. It is recommended to select spring water sources as far possible because it's water quality is often better than surface water sources. As a result, water treatment is not generally required, which reduces the investment and recurrent costs. Spring intakes are normally a box-like structure with a single or double chamber. The intake should be constructed in such a way that it is easily accessible for regular maintenance, protects the source from surface runoff contamination, deters animals from approaching it, and protects from landslides and erosion. All intakes are provided with proper washouts and air valves. In the hills of Nepal, the spring intake is usually built with stone masonry and an RCC slab cover.

Storage Tanks

Storage tanks are necessary to balance the supply and demand of water. While the supply of the source is uniform throughout the day, consumption has peaks during the morning and the evening hours. Thus, if the yield of the source does not meet the demand as per the consumption pattern, storage tanks are required.

For seasonally regulated systems both the Modified Thai Jar (MTJ) and Ferrocement lined tank (FCL) are used for water storage. However, for continuous flow and year round controlled systems only the MTJ model is used. In such cases, more than one jar may be needed to meet the required storage volume. The necessary tank size is determined during the design phase and is dependent on the supply and demand

of water at different times of the day. After calculating the volume of storage, the nearest larger standard size is chosen.

The tank site should be both technically and socially feasible. It should be built on stable ground not prone to landslides and flooding and there should be easy drainage of any overflow. Often, communities are proud of their tanks, so the tank location must be fixed in close consultation with the beneficiary households. It is recommended to built the tank as close to the village as possible to ensure better care in operation and maintenance. Suitable fencing has to be provided around the tanks for their protection.

Water Outlets

Two types of water outlets, tap-stands and offtakes, are constructed for domestic and irrigation use respectively. Every outlet is provided with two taps for better service. In each outlet a flow regulator balances and adjusts the flow rate. One domestic tap-stand is designed to serve 4 – 6 households. Likewise, one offtake provides irrigation to a 500-1000 m^2 area depending on the crop season and type of micro irrigation used. Tap-stands are built in locations to maximize equity in distance for beneficiary households. Offtakes are located approximately in the center of several households' crop fields. The number of offtakes and tap-stands depend on the concentration of the houses and field to be irrigated. Usually each tap-stand and offtake will have a service coverage between 3-6 houses and 4-7 crop fields respectively. The WUA in consultation with the CO survey team decide the location of the outlets. Both types of outlets are constructed using a special mould. The following basic criteria have to be met while choosing outlet locations:

1. Maximize equity in distance to households/farms.
2. Stable ground
3. Good accessibility
4. Easy drainage of waste water
5. Not prone to damage by flood or landslide
6. Land for the structure and access walkway is available free of cost. (The landowner must provide their land contribution in writing during the feasibility study.)

4.3.5 Testing

After construction is completed the following tests are carried out:

1. Discharge measurement at the inlet point of the storage tank and outlets. Discharge of the outlets are fixed by adjusting the flow regulator.
2. Observation along the entire pipe network and at each structure. Leaky points are fixed.
3. After proper adjustments the system is allowed to run for a few days intermittently. The system components are observed once again. If the operates successfully the pipelines and structures are backfilled.

4.4 Post-Construction Phase

4.4.1 Nomination of System Operators and Team of Caretakers

The WUA will select a System Operator and the team of Caretakers to perform various functions for operation and management of the water system.

System Operator: (SO)
The SO is nominated by the WUA and is responsible for the operation of the water system on a regular basis by controlling tank outlet flow and performing repair and maintenance. The SO is accountable to

the water users and is either a volunteer or is hired and paid for by the WUA fund. The SO has to meet the following criteria:

1. be one of the beneficiary households
2. have received basic training on plumbing and masonry
3. have earned community trust
4. not likely to migrate from the village
5. should possess basic literacy
6. have been heavily involved during scheme construction

Team of Caretakers:

This is a team which is selected by the WUA to help maintain the smooth functioning of the water system and perform regular monitoring. The team reports to the WUA and/or SO if any problems are detected. Each team has a service coverage of 2-4 taps. There can be 2- 4 care takers for systems serving 20-50 households. At least one woman must be nominated in each team. It is recommended that new team members be selected every 6 months because it is voluntary work. The caretakers also take responsibility for collecting a monthly water tariff from usersand depositing it into the WUA account. The team reports to the WUA.

4.4.2 Training

Just after completion of the scheme, a number of trainings on the water system, micro irrigation and sanitation are conducted as given in the following table.

Table 4.4.2: Summary of the Post-construction Training

Title of the Training	Trainee	Duration
Scheme operation and Maintenance	System Operator	2 days
Scheme monitoring	Caretakers team and WUA members	Half day
Basic sanitation and health	All water users households	Half day
Installation and operation of Micro irrigation system	Lead farmers	One day
Book keeping / accounting (Refresher)	WUA members	Half day

A set of basic tools and formwork are provided to the WUA for replication of the technology and regular operation and maintenance of the water system. The CO and WUA members are responsible for organizing these training activities. A brief training report is prepared by the CO to maintain a record *(*see *Annex 14)*.

4.4.3 Project Completion Meeting and Formal Inaguration

Just after completion of the scheme a WUA meeting is held with the CO and VLO representatives as invitees. The meeting encompasses the following:

1. Water distribution schedule
2. Review of the composition of the Water Users Association while maintaining more than one third women participation.
3. Preparation of a project completion report (A*nnex 16)* with the CO playing the lead role in its preparation. The report describes the entire mus process that took place including the total construction cost and contribution from various partners. Any deviations from the initial plan are mentioned.

4. Nomination of the team of Caretakers
5. Preparation of the protocol (bi-laws) for the management of the scheme including collection of the water tariff and the roles and responsibilities of the System Operator and the team of Caretakers.
6. Organizing the Inaguration Ceremony– date, participants, venue, budget etc.

Later, a formal gathering of all stakeholders is organized to inaugurate the scheme. The ceremony covers the following

1. Introduction of the WUA, System Operator and the Caretakers
2. Inauguration of the scheme
3. Presentation of the Scheme Completion Report (by CO Representative)
4. Presentation and endorsement of the Scheme Management Protocal (bi-laws)
5. Water distribution schedule formalization
6. Clarification of the roles and responsibilities of the System Operator and Caretakers

4.5 Evaluation Phase

After completion of the schemes the project is evaluated periodically both internally and externally. The WUA carries out the internal evaluation while external agencies supporting the project conduct the external evaluation.

The evaluation essentially includes socio-technical, economical and institutional parameters. It is recommended that the WUA carry out the internal evaluation of the scheme on a bi-annual basis. The frequency of the external evaluation will depend on available resources, but the first year after scheme completion is the most critical. It is recommended that some financial resources be allocated in the WUA account during the construction phase which can be used for internal scheme evaluation post project.

Annex 1

Basic Criteria for the MUS Development

The Application Form for MUS development should meet the following criteria.

i) **Current number of households**: 20- 60

ii) **Location**: Rural or peri-urban. At least 2 km from the local town

iii) **Water Right**: Water source to be free from water right problem.

iv) **Water Source**: Preference will be given to the spring source.

v) **Water discharge**: Enough to meet at least 600 litres of water per household per day for the projected population of 10 years.

vi) **Elevation of the water source**: Water source to be located at a sufficiently higher elevation from the village so the water can be supplied by gravity.

vii) **Distance between village and the water source:** to be less than 3 k.m.

viii) **Alignment:** to be suitable with minimum number of crossings, hard rock and without sharp U-profile alignment.

ix) **Water Quality** : to be drinkable

x) **Hardship in water collection :** At least more than ½ hour for the round trip during two months of the year.

xi) **Willingness to Community contribution:** Strong commitment to provide voluntary labour for non-cash components of the construction.

xii) **O&M Cost :** All households ready to deposit Rs. 50 as an initial deposit for the O&M cost. Also willing to pay the regular water tariff.

xiii) **Adoption of microirrigation technology :** More than 75 % of the beneficiaries willing to adopt MIT. (drip or sprinkler system)

xiv) **Community Contribution :** Commitment on

a. providing land at free of cost for constructing tank and other structures
b. voluntary contribution for collection/ transportation of materials, and unskilled labour.
c. no obstruction in laying the pipes for transmission and distribution

xv) **Social aspects:** No potential conflict in water distribution.

Annex 2

Preliminary Information about the proposed scheme

Proposed name of the Scheme: …….

1. District: …… VDC ……Ward No….. Village: ……
2. Accessibility: Draw a location Map of the village / water source / nearest road and market center
3. Total Households : …….. 4. Current Population …….
4. Ethnicity: a) Dalit …….. b) Janajati…… c) Others……..
5. Main Occupation: Agr …….. HH, Business……. Service …….. others ……
6. Landholding:

- less than 10 Ropani: …… HH 10 – 20 Ropani …. HH More than 20 Ropani ……. HH

7. Food Sufficiency Situation (from own production)

- Less than 6 month …… HH 6- 9 month ……. HH More than 9 month …….. HH

8. Availability of more than ½ Ropani Bari land near the house…….HH
9. Existing Water Supply Situation

-Name of the Water Source: Type: ……..

- Time required to fetch water (round trip) :

Winter…… Minute Spring …… Minute

- Water Quality: Good/ Medium / Poor
- Reliability of Supply: Good/ Medium / Poor
- Volume of Daily Water Use: Volume …… Gagri / Litres

Domestic …….. Livestock ……. Others ……..

10. Existing Vegetable Gardening practice near the house yard

- Winter: Area …… irrigation method ……..
- Spring: Area …… irrigation method ……..

11. Proposed Water source:

- Name:
- Ownership:
- Distance between the source and the village
- Approximately Height difference between the source and the village
- Water Quality
- Approximate Discharge:
- Number of Gullies Crossings along the alignment

- Portion of hard rock or landslide along the alignment

12. Community willingness and commitment

- Cash Contribution: for construction for O&M…….
- Labor contribution for construction
- Purchase of micro-irrigation Units
- Production and marketing of high value crops (vegetable, fruits…)
- Participation of women in vegetable enterprise & WUA

13. Possibility of the financial support from organization

S No	Name of the organization	Type of Support (Cash / Kind)
1		
2		
3		

14. Availability of agro-input and extension services
15. Any other comments / remarks

Name : …….. Signature : ……. Date: ……

Annex 3

Scheme Screening Table

Scheme Screening Table

Name of Scheme:
District: Municipality/VDC: Ward No:
Tole/Village

S.No.	Description	Full Score	Score secured	Remarks
1	**Hardship: Travel time to fetch water (round trip)**	**12**		
	Less than 10 minutes	2		
	10 - 30 minutes	5-8		
	30 minute - 1 hour	10-11		
	More than 1 hr	12		
2	**Distance between Village and water source**	**5**		
	< 1 Km	5		
	1-2 km	3-4		
	2-3 km	2-3		
	more than 3 km	1		
3	**Type of Water Source**	**6**		
	Springs	6		
	Stream / River	3		
	Lake, Pond, Canal	2		
4	**Water Rights Issue**	**10**		
	not an issue	10		
	can be solved	5		
	cannot be easily solved	2		
5	**Food Sufficiency**	**7**		
	Majority: less than 6 months	7		
	Majority: Upto 6-9 months	3-5		
	Majority: Whole year	2		
6	**Percentage of Socially Deprieved Population (Dalit / Janajati)**	**6**		
	>= 75	6		
	33 - 75 %	3-5		
	Less than 33 %	2		
7	**Distance from the road head/ market center (km)**	**4**		
	> 20 km	0		
	20 to 5 km	2-3		
	< 5 km	4		
8	**Availability of 250 Sqm unirrigated bari land near the house**	**5**		
	All Household	5		
	75 % of the household	4		
	50-75 % of the household	2-3		
	less than 50 % of the household	1		
9	**Commitment to adopt microirrigation system**	**10**		
	All Household	10		
	50-75 % of the household	6-8		
	< 50 % of the household	2		
10	**Commitment to provide O&M cost and labor contribution**	**10**		
	All household	10		
	50-75 % of the household	6-8		
	< 75 % of the household	2		
11	**Commitment for involving women in vegetable enterprise & WUA**	**5**		
	Good	5		
	moderate	4		
	poor	3		
12	**Potentials for financial support from organizations for construction**	**15**		
	Good	15		
	Medium	8		
	Poor	5		
13	**Availability of Agro-input and extension services**	**5**		
	Good	8		
	Medium	6		
	Poor	3		
	Total	**100**		

Annex 4

FEASIBILITY STUDY FORM

Name of the Scheme: ..... ……. ……

1. General Information

1.1 LOCATION

District: ..... , VDC (Ward): ---------- (…..) Village …….

Village (Tole): ---------- Ward No.: ----------

1.2 **Accessibility:**

Nearest point on the highway/road ----------

Distance and average walking time between road point and the village ……km

…….minute/hr

Nearest market place ----------

1.3 Demography / Ethnicity

Present Households (to be served by scheme) : ……. Present Population: ……..

Design Households (Design Period 10 years) : …….. Design Population …….

Ethnicity: Dalits …… HH Janajati……. Others …….

NORTH

Location Map (Show the study village, road head and prominent places along the route)

2. General Socio-economic condition

- **Food Sufficiency :**

Less than 6 month : …….. HH, 6-9 Month : ……HH, 9-12 month : …….

- **Household and Land area near by house-yard:**

< 1/4th Ropani: …… HH, ¼ to ½ Ropani: ……. HH,

½ Ropani – 1 Ropani: …HH, > 1 Ropani …….. HH

- **Main source of cash incomes**

a. Agriculture / Livestock (Rank : ….) b. Service: (Rank….) c. Wage Labour (Rank …….)

d. Remittence (Rank) e. Pension (Rank……) f. Business (Rank…) g. Others (Rank….)

- **Average Annual expenditure per household**

a. Food: …….. b. cloth…….. c. education……. d. festivals……

e. medicine …… f. travel …….. g.

- **Consumption of the fresh vegetables:**

a. less than 6 month……HH b. 6-9 month : …… HH c. throughout the year …….. HH

- **production and sales of fresh vegetables , Households and Gross annual sales**

a. Rs. 1000- 2000 : ….. HH b. Rs. 2000- 5000 : ….. HH c. More than Rs. 5000

- **General Cropping pattern of the Bari land**

	Jan	**F**	**M**	**A**	**M**	**J**	**July**	**A**	**S**	**O**	**N**	**D**	**Jan**
Crops													
Crops													
Crops													

- **Livestock**

Average number of livestock per households / hh: Buffalo: …. Cow:……. Ox:……. Goats:……, Pigs:: ….

- **Programs and Participation of women in the Income Generation Activitions**

S No	Program	Participation in Input level	Participation in Output level

- **Literacy**

Number of people household

- with education above SLC Level
- with secondary school education
- from primary to secondary level

3. Existing water supply situation (domestic)

- Name of water source: Public Tap / Spout / Others
- Travel time (round trip) to fetch water: Winter …… Spring ……..
- Reliability of water supply: Good / medium / poor
- Water Quality: Good/ medium/ Poor
- Incidence of water borne diseases in a year: ……
-

4. Proposed Water Source

SN	Particulars	Source I	Source II	Remarks
1	Source name			
2	Type of source (spring/stream/Kuwa/irrigating canal .. …….. …… ……)			
4	Safe estimated Yield (lps)			
5	Date of discharge measured (lps)			
6	Source location (VDC, ward no., tole etc.)			
7	Present water use (drinking, irrigation, others)			
8	Distance from the village			
9	Source ownership private /public, registered or not			
10	Source disputes possibilities (between different use priorities, diff villages etc.)			
11	Possibility of pollution of source (likely/possible/unlikely)			
13	Any legal obstructions along the alignment for pipe line construction			
13	Alignment profile: **A) Transmission section** -Length (m) - Elevation difference (m) - Rolling - U-profiles - No of Crossings >12 m span - hardrock / landslide portion **A) Distribution section** - Total Length (m) of the network - Rolling - U-profiles - No of Crossings >12 m span - hardrock / landslide portion			

5: Location of the Outlets (Tapstands and Offtakes)

SN	Village (Tole) Name	Outlet No	No of HH benefited	Elevation	Location (prominent objects if any)
A	**TAPSTANDS (T1, T2,..)**				
1					
2					
3					
4					
5					
6					
7					
B	**OFFTAKES (O1, O2,…)**				
1					
2					
3					
4					
5					
6					
7					

6: Availability Cost of the local materials

S No	Description	Unit	Rate/Unit	Place of source	Distance
1	Sand	Cum	Rs.		

2	Gravel	Cum	Rs.		
3	Stone	Cum	Rs.		
4	Local wood	Cum	Rs.		
5	Skilled Mason	Person-day	Rs.		
7	Labour	Person-day	Rs.		

7: Willingness and commitment in Participation

S No	Description	Observations
1	WUA formation with more than 33% women participation	
2	General enthusiasm towards the project	
3	Labour contribution for earthwork	
4	Transportation of materials (road head – site)	
5	Provision of local materials	Sand: ……. Stone:…….. Gravel:…… Water:……
6	Purchase of microirrigation units (Drip or sprinkler system) and its application	
7	Collection of O&M fund (approx Rs 500 per tap or offtake)	
8	Monthly water tariff (approx. Rs 20 per HH per month)	
9	Cash contribution for consruction	Up to Rs……..
10	Land for storage tank and outlets at free of cost	
11	Sound WUA institution	
12	Approach for financial support from institutions	
13	Other Contributions	

8: Tentative Cost Estimate

S No	Description	Qty	Unit	Rate	Amount
A	Direct Cash Component				

A.1	**Cement**				
A.2	**HDPE Pipe and Fittings**				
	a) Dia…				
	b) Dia…				
	c) Dia…				
	GI Pipe				
	a) Dia…				
	b) Dia…				
	c) Dia…				
	Fittings				
A.3	**CGI Sheet**				
A.4	**Chicken Wiremesh**				
A.5	**Steel Rod and Binding wire**				
A.6	**Gabion wire**				
A.7	**Moulds**				
A.8	**Tools**				
A.9	**Skilled Mason**				
B	**Indirect Cash Component**				
B.1	**Sand**				
	Stone				
	Gravel				
	Bamboo / Local wood				
	Water				
	Labour				

Per HH cost , including indirect cash cost	**NRs.**
Per Capita Cost, including indirect cash cost	**NRs.**
Per HH cost , excluding indirect cash cost	**NRs.**
Per Capita Cost, excluding indirect cash cost	**NRs.**

9. Scheme Layout Map

(Show the pipe network and diameter, structures, length, elevation at strategic points, and settlement)

Annex 5

Scheme Ranking Table

S.No.	Parameter	Full Score	Score secured		
			Scheme-1 ……	Scheme-2 ……	Scheme-3 ……
1	Hardship to obtain water	12			
2	Ownership of the water source	10			
3	Type of Water Source / Water quality	5			
4	Technical suitability of alignment	6			
5	Land availability for structure sites	5			
6	Commitment for providing voluntary labour	8			
7	Per capita cost (NRs),	10			
8	Availability of land for high value crop production	5			
9	Potentials for the match cost	10			
10	Availability of construction materials & masons	5			
11	Level of poverty and food insufficiency	8			
12	Inclusion of Disadvantaged population	6			
13	General impression of the surveyer	5			
14	Access to Input / Output market for agro production	5			
	Total	**100**			

Prepared by: …… ***Designation: ……*** ***Date: ……***

Annex 6

…….. Multiple Use Scheme

District:……. VDC: ……Ward:……. Village:……

Income Account for Microirrigation Technology Purchase

S No	Name of the Household	Date	Amount (Rs)	Date	Amount (Rs)	Total
1	……..					
2	……..					
3	……..					
4	……..					
5	……..					
6	……..					
7	……..					
8	……..					
9	……..					
10	……..					
11	……..					
12	……..					
13	……..					
14	……..					
15	……..					
16	……..					
17	……..					
18	……..					
19	……..					
20	……..					
21	……..					
22	……..					
23	……..					
24	……..					
25	……..					
				Grand Total		

…….. Multiple Use Water Scheme

District:……. VDC…… Ward….. Village……...

Income Account for Construction Works

S No	Date	Donor	Cash	Kind	Remarks

…… Multiple Use Water Scheme

District:…… **VDC:……** **Ward No: ……** **Village: ……**

Income Account of the Water Tariff Collection . **Year:……**

S No	Name of the Household	Amounts												
		J	F	M	A	M	J	J	A	S	O	N	D	Total
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														

…….. Multiple Use Scheme

District:……. VDC: ……Ward:……. Village:……

Income Account for O&M Cost (Pre-construction Deposit)

S No	Name of the Household	Date	Amount (Rs)	Date	Amount (Rs)	Total
1	……..					
2	……..					
3	……..					
4	……..					
5	……..					
6	……..					
7	……..					
8	……..					
9	……..					
10	……..					
11	……..					
12	……..					
13	……..					
14	……..					
15	……..					
16	……..					
17	……..					
18	……..					
19	……..					
20	……..					
21	……..					
22	……..					
23	……..					
24	……..					
25	……..					
				Grand Total		

Annex 7

……. Multiple Use Water Scheme

District: **VDC:…… Ward:…….. Village…….**

Expenditure Record

Month: ……. Year……..

S No	Date	Purpose	Amount (Rs)	Remarks

Treasurer:…… ***Chairperson/ Secretary……***

Annex 8

…… Multiple Use Water Scheme

District **VDC** **Ward** **Village**

Record of the Voluntary Labour Contribution: Attandence Record **Month:** **Year**

S No	Name of the Household	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1																																	
2																																	
3																																	
4																																	
5																																	
6																																	
7																																	
8																																	
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14																																	
15																																	
16																																	
17																																	
18																																	
19																																	
20																																	

WUA Representatives

1 2 3

Annex 9

Survey Field Book (Abney Level)

…… Multiple Use Water Scheme

Surveyor: Page No._____ of _____

VDC:…… Ward No…….. Village…… Date:

Station		Ground	Angle		Vert. Distance		Average	Reduced	Compass	Pipe line sketch with prominent points, places necessary for GI pipes, benchmark, temples, canals etc.
From	To	Distance	Backsight	Foresight	Rise	Fall	Rise or Fall	Level	Bearing	

NB: Vertical Distance = Ground distance X Sinθ

Annex 10

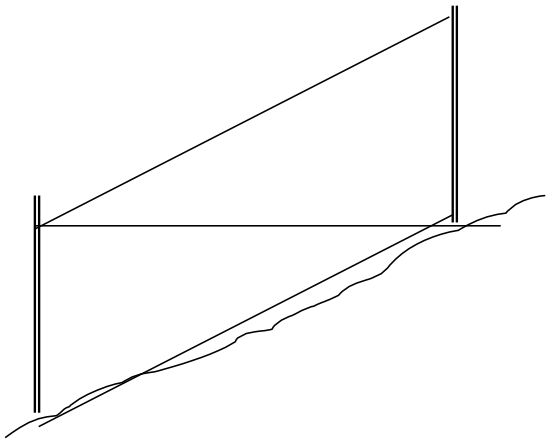
Survey Field Book (Abney Level)

…… Multiple Use Water Scheme

Surveyor: Page No._____of _____

VDC:…… Ward No…….. Village…… Date:

Station		Ground	Angle		Vert. Distance		Average	Reduced	Compass	Pipe line sketch with prominent points, places necessary for GI pipes, benchmark, temples, canals etc.
From	To	Distance	Backsight	Foresight	Rise	Fall	Rise or Fall	Level	Bearing	



NB: Vertical Distance = Ground distance X Sinθ

Annex 11

Agreement between Project Supporters

Agreement between

…….. and ……

for the construction of

…….. Multiple Use Water Scheme

in

District: …… VDC/Ward …….. Village

Project Supporter 1

Name of the Representative : Designation

Organization: Date

Project Supporter 2

Name of the Representative : Designation

Organization: Date

Project Supporter 3 (WUA on behalf of the benefiting households)

Name of the Representative : Designation

Organization: Date

1. Background and Introduction of the Scheme :

2. Salient Features

1	Name of the Scheme	
2	Name of the water source & location	
3	Service area: VDC, Ward, Village	
4	No of benefiting households	Present: ….. Design:…..
4	No of benefiting population	Present: ….. Design:…..
4	Main Structures	
	Intake type / Size	
	Storage Tank/s , No, Type size	
	Tapstands , No	
	Off takes	
	Other structures	
5	Pipeline	
	Length of the Transmission section	
	Length of the Distribution section	
	Total Length	
6	Estimated Cost	
	Direct Cash Cost	
	Indirect Cost	
7	Quantities of Major Materials	
	Cement	
	Steel rod	
	CGI Sheet	
	Chicken Wiremesh	
	HDPE Pipe : Dia ….. mm	
	HDPE Pipe : Dia ….. mm	
	HDPE Pipe : Dia ….. mm	
	HDPE Pipe : Dia ….. mm	
	GI Pipe : Dia ….. mm	
	GI Pipe : Dia ….. mm	
	GI Pipe : Dia ….. mm	
	GI Pipe : Dia ….. mm	
	Fittings	
	Sand	
	Gravel	
	Stone	
8	Labour requirement	
	Skill Labour	

	Unskilled Labour	
9	Per capita cost	
10	Per Household cost	

3. Role and Responsibilities of the Project supporters

3.1 Coordinating Organization:

a.
b
c
d
e
f

3.2 Project Supporter ……..

a.
b
c
d
e
f

3.2 Project Supporter (Community)

a.
b
c
d
e
f

4. Summary of Contribution

S No	Description	Amount (NRs)	As % of the total cost
1	Coordinating Organization		
	a)		
	b)		
	c)		
	Total		
2	Project Supporter 1		
	a)		
	b)		
	c)		
	Total		
3	Community		
	a)		
	b)		
	c)		
	Total		

Grand Total:

Annex 12

…….. Multiple Use Water Scheme
Workplan of the Construction Activities

S No	Description of Activities	Month 1				Month 2				Month 3				Month 4				Responsible Organization
		W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		

Representative , CO:
Name:
Designation

Representative , WUA:
Name:
Designation

Witness
Name:
Designation

Annex 13

---------- Water User's Association
---------- Multiple Use Water Scheme

Incoming/ Outgoing stock

Month: …….. Year:……

SNo.	Date	Particulars	Construction materials			Remarks
			arrival	delivery	remainder	
A: Name of the Material: Cement						
Opening Stock						
Closing Stock						
B: Name of the Material: Steel Rod						
Opening Stock						
Closing Stock						
C: Name of the Material: Chicken Wiremesh						
Opening Stock						
Opening Stock						

Stock Keeper: …….. *Chairperson of WUA:……..*

Annex 14
Agreement between WUA and the Contractor

Agreement between

…….. Water Users Association and ……

for the construction of

…….. Multiple Use Water Scheme

in

District: …… VDC/Ward …….. Village

On behalf of the WUA
Name of the Representative : Designation

On behalf of the Contractor / Mason

Name of the Representative : Designation
Address:

Witness

Name : Address:

Date of Agreement: Venue:

3. Background and Introduction of the Scheme :

4. Role and Responsibilities of the Water User Association

5. Role and Responsibilities of the Contractor ….

6. List of Activities and Timeline

Activity No	Description	Deadline

5. Payment Schedule

6. Construction Quality Control

Annex 15

Training Completion Report

1. Title of the Training and duration:
2. Organized by: …….
3. Date, Venue:
4. Participants: (Male / Female)
5. Trainee background:
6. Resource persons: Name , designation,
7. Main Objectives:
8. Training Methods used:
9. Evaluation: (Change in skill and knowledge after the training)
10. Training Cost:

Annex 16

Project Completion Report

Scheme Name ----------, Scheme code ----------, Type: MUS

Beneficiaries: ---------- persons, ---------- households
Total cost : ----------, Per capita cost ----------, per household cost ----------

Particulars	Unit	Planned (No.)	Actual (No)	Difference (No)	Justification for the change
Project Infrastructures					
Intake (No/Type)					
Storage Tank					
Tapstand					
Offtakes					
Others					
Pipeline					
Transmission main					
Distribution Main					
HDPE					
GI					
Materials					
Non local					
Cement					
GI Wire					
Binding wire					
MS Rod					
Transportation					
Labour					
Skilled					
Unskilled					
Cost Sharing mechanism					
Total Cost					
Coordinating Organization					
WUA					
VDC/DDC					
Others					
O & M Cost Collected					
Microirrigation Technology					
Others					

Signature and date	Signature and date
Name of Project staff (engineer/overseer)	Name of WUA chairman
Witness	